Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Cancel Claims 1-6, 8-19, 21-23, and 29-49.

Add the following Claims 50-91.

Claims 1-49 (canceled)

50. An isolated or substantially pure form of a nucleic acid molecule capable of hybridizing to SEQ ID Nos: 1-7 or the complementary thereof and encoding a mammalian GDNF family receptor α-4 (GFR α -4).

51. The nucleic acid molecule of claim 50 which is derived from a rat, mouse or human.

52. The nucleic acid molecule of claim 50 encoding a mammalian GDNF family receptor α -4 (GFR α -4) having the amino acid sequence illustrated in Sequence ID No. 8 or 9 or encoding a functional equivalent or bioprecursor of said receptor.

53. A nucleic acid molecule according to claim 50 which is a DNA molecule.

54. A nucleic acid molecule according to claim 53, wherein said DNA molecule is a cDNA molecule.

55. An isolated nucleic acid molecule comprising the sequence illustrated in any of SEQ ID Nos 5, 6, or 7 or the complementary sequence thereof.

56. A GFR α -4 receptor encoded by a nucleic acid molecule according to claim 50.

57. A DNA expression vector comprising a nucleic acid molecule according to claim 53.

58. A host cell transformed or transfected with the vector according to claim 57.

59. A host cell according to claim 58, which cell is a eukaryotic cell.

60. A host cell according to claim 58 wherein said cell is a mammalian cell.

61. A host cell according to claim 60 which cell is a human embryonic kidney cell HEK293 or a Cos-7 cell.

62. A transgenic cell, tissue or organism comprising a transgene capable of expressing a GFR α -4 receptor protein comprising the amino acid sequence illustrated in Sequence ID No's. 8 or 9 or the amino acid sequence of a functional equivalent or bioprecursor thereof.

63. A transgenic cell tissue or organism according to claim 62, wherein said transgene comprises a nucleic acid molecule according to claim 50.

64. A GFR α -4 receptor protein or a functional equivalent derivative or bioprecursor thereof, expressed by the cell according to claim 58.

65. A HEK293 or Cos-7 cell line transfected or transformed with the expression vector of claim 57.

66. An antisense molecule comprising a nucleic acid which is capable of hybridizing to the nucleic acid of claim 50.

67. A pharmaceutical composition comprising the molecule according to claim 66.

68. An isolated receptor having the amino acid sequence as illustrated in any of SEQUENCE ID No 8 or 9 or the amino acid sequence of a functional equivalent or bioprecursor of said receptor.

69. A pharmaceutical composition comprising a nucleic acid molecule according to claim 50 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.

70. A pharmaceutical composition comprising the receptor according to claim 68 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.

71. A method of determining whether a compound is an agonist, antagonist or a ligand in relation to GFR α -4 receptor, according to claim 56, which method comprises contacting a membrane preparation of cells expressing said GFR α -4 with said compound in the presence of cRET or similar protein which interacts with GFR α -4 in the signal transduction pathway of which GFR α- 4 is a component and monitoring the level of any interaction of GFR α -4 with cRET or said similar protein.

72. A method of producing an antagonist or agonist of GFR α -4 comprising the steps of the method of claim 71; and additionally

(i) synthesizing the compound obtained or identified in said method or a physiologically acceptable analog or derivative thereof in an amount sufficient to provide said antagonist or agonist in a therapeutically effective amount to a patient; and/or

(ii) combining the compound obtained or identified in said method or an analog or derivative thereof with a pharmaceutically acceptable carrier.

73. A pharmaceutical composition comprising a compound identifiable as an agonist by the method according to claim 71 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.

74. A method of promoting GFR α -4 activation in a mammal comprising administering a therapeutically effective dose of a compound identifiable as an agonist by the method of claim 71.

75. A pharmaceutical composition comprising a compound identifiable as an antagonist by the method according to claim 71 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.

76. A method of limiting GFR α -4 activation in a mammal comprising administering a therapeutically effective dose of a compound identifiable as an antagonist by the method of claim 71.

77. A pharmaceutical composition comprising a compound according to claim 73 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.

78. An antibody specific for GFR α -4 receptor protein having an amino acid sequence as illustrated in Sequence ID No's. 8 or 9.

79. A pharmaceutical composition comprising an antibody according to claim 78 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.

80. A method of identifying ligands for a mammalian GFR α -4 receptor protein, which method comprises contacting a receptor encoded by a nucleic acid molecule of claim 50 with a cell extract or a compound to be tested and isolating any molecules bound to said receptor.

81. A method of determining whether a compound is a ligand for a GFR α -4 receptor, which method comprises contacting a cell expressing said receptor according to claim 58 with said compound and monitoring the level of any GFR α -4 mediated functional or biological response.

82. A method according to claim 81 which comprises monitoring the level of phosphorylation in said cell.

83. A compound identifiable as a ligand for GFR α -4 according to the method of claim 40 for use as a medicament.

84. The compound of claim 83 wherein the medicament is used in the treatment of neurodegenerative diseases, Alzheimers disease, Parkinsons disease, Motor Neuron Disease, peripheral neuropathy, spinal cord injury, familial hirschsprung disease in addition to carcinoma and diseases associated with GFR α -4 dysfunction.

85. A kit for determining whether a compound is an agonist or an antagonist of GFR α -4 receptor protein which kit comprises a cell according to claim 58, means for contacting said cell with said compound and means for monitoring the level of GFR α -4 mediated functional or biological response in said cell.

86. A kit according to claim 85, wherein said GFR α -4 mediated functional or biological response comprises the level of phosphorylation in said cell.

87. A diagnostic kit including a probe which comprises any of, a nucleic acid molecule according to claim 50 or a fragment thereof or an antisense molecule capable of binding to a nucleic acid molecule of claim 50 and means for contacting biological material to be tested with said probe.

88. A kit for determining whether a compound is a ligand of a mammalian GFR α -4 receptor protein, which kit comprises a membrane preparation from cells expressing GFR α -4, means for contacting said preparation with said compound in the presence of cRET or a similar protein involved in the signal transduction pathway of which GFR α -4 is a component and means for measuring any interaction between GFR□-4 and cRET or said similar protein.

89. An isolated nucleotide acid molecule of at least 15 consecutive nucleotides in length from SEQ ID Nos 5-7.

90. The method of Claim 74 wherein the method is used to treat neurodegenerative diseases, Alzheimers disease, Parkinsons disease, Motor Neuron Disease, peripheral neuropathy, spinal cord injury, familial hirschsprung disease in addition to carcinoma and diseases associated with GFR α -4 dysfunction.

91. The method of Claim 76 wherein the method is used to treat carcinomas or in alleviating pain.